AMENDMENTS TO THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A disposable cartridge for mounting an extracorporeal blood passage on a ~~blood~~ pump device comprising:

a. a first cartridge housing supporting said blood passage ~~and further comprising a latch~~, wherein said first cartridge housing is configured to seat in ~~fits into~~ a first recess of the ~~blood~~ pump device, wherein said blood passage has a blood inlet connectable to a vascular system of a patient and a blood outlet connectable to the vascular system such that blood flows through the blood passage ~~and said latch releasably attaches to the blood pump device when the housing is fitted into the recess~~;

b. a blood pump coupling loop of the blood passage ~~fixed~~ attached to the first cartridge housing and extending outwardly from said housing, wherein a blood pump of the device engages the pump coupling loop when said first cartridge housing ~~latch~~ is ~~attached to~~ seated on the blood pump device~~, wherein through said blood passage flows blood withdrawn from a patient and said blood pump draws blood from the patient~~;

~~c. an electronic pressure sensor fixed to the first cartridge housing, where the pressure sensor is arranged to sense a pressure in the blood flow through the blood passage of the cartridge and outputs an electrical signal indicative of the pressure, wherein the pressure sensor is structurally separated from said blood pump, and wherein said sensor has a fluid passage having an internal diameter substantially the same as an internal diameter of the blood passage~~

c. a second cartridge housing supporting said blood passage and a filtrate passage, wherein said second cartridge housing is distinct and separate from said first cartridge housing, wherein said second cartridge housing is configured to seat in a second recess of the blood pump device , and

d. a filtrate pump coupling loop of the filtrate passage extending outwardly from said second cartridge housing, wherein a filtrate pump of the device engages the filtrate pump coupling loop when said cartridge housing is seat on the pump device, wherein through said filtrate passage flows filtrate withdrawn from blood in the blood passage.

2. (Currently Amended) A cartridge as in claim 1 wherein ~~an electrical signal is a voltage level indicative of the pressure~~ said blood passage connects said first cartridge housing to said second cartridge housing.

3. (Currently Amended) A cartridge as in claim 1 ~~further comprising a second cartridge housing supporting a second pump coupling loop of the blood passage and a blood filter coupled to the blood passage, and the blood passage further includes a blood return line extending from the second cartridge to return blood to the patient, wherein the second cartridge housing further comprises a latch which releasably engages the blood pump device when the second cartridge housing is fitted into a second recess in the housing and when said second loop engages a filtrate pump of said pump device~~ wherein an electronic pressure sensor is fixed to the first cartridge housing and is arranged to sense a pressure of the blood flow through the blood passage, wherein said sensor outputs an electrical signal indicative of the blood flow pressure to the device.

4. (Currently Amended) A cartridge as in claim ~~3~~ 1 wherein the ~~further comprising a filtered fluid~~filtrate passage extending from the ~~filter and affixed to the second cartridge housing, and a second pressure sensor in the filtered fluid passages sensing a pressure of filtered fluid flowing through the filtered fluid passage~~ second cartridge housing discharges filtrate fluid to a filtrate collection container.

5. (Previously Presented) A cartridge as in claim 1 further comprising a pressure sensor housing affixed to the first cartridge housing for the pressure sensor, where the pressure sensor housing includes a smooth tubular channel contiguous with the blood passage fixed to the first cartridge housing and the pressure sensor is mounted flush with a wall of the first cartridge housing.

6. (Currently Amended) A cartridge as in claim 3 where a second pressure sensor is ~~integrated into the housing of a hemofilter and the hemofilter is mounted on~~ to fixed to the second cartridge housing and said second pressure sensor is arranged to sense a pressure of filtrate flow through the filtrate passage, wherein said sensor outputs an electrical signal indicative of the filtrate flow pressure to the device. .

7. (Currently Amended) A cartridge as in claim ~~1~~3, where the pressure sensor and the pump coupling loop of the blood passage are rigidly fixed to an underside of the first cartridge housing and the first cartridge housing detachably attaches to the pump device adjacent to a raceway of the blood pump and said raceway receives the loop ~~when the first cartridge housing is inserted into the recess of the pump device~~.

8. (Previously Presented) A cartridge as in claim 7 where the blood passage is formed of transparent material so that the blood flow is visible.

9. (Currently Amended) A cartridge as in claim 7 wherein the cartridge is ~~disposed of~~ discarded after treatment of the patient and after being released from the pump device.

10. (Currently Amended) A cartridge as in claim ~~3~~30 wherein the filter is of a group consisting of a hemodialyzer, hemofilter or hemoconcentrator, and the filter includes an integral pressure sensor embedded in a blood passage wall of the filter.

11. (Currently Amended) A cartridge in claim ~~10~~3 where the pressure sensor is in fluid contact with the blood.

12. (Currently Amended) A cartridge as in claim [[4]] 6 where the second pressure sensor is embedded in the filter and is in fluid contact with the filtered fluid.

13. (Currently Amended) A cartridge as claim ~~1~~3 wherein the pressure sensor is sealed in a pressure sensor housing formed of a biocompatible and flexible material, and the sensor housing includes an integral and flexible membrane in contact with the blood and electronic sensors.

14. (Currently Amended) A cartridge as in claim ~~1~~3 wherein the pressure sensor includes a pressure responsive diaphragm exposed to the blood flow and a mechanical-to-electric transducer coupled to the diaphragm and having an electrical signal output indicative of the pressure of the blood.

15. (Original) A cartridge as in claim 14 wherein the mechanical-to-electric transducer includes a strain gain bridge or capacitive element to convert displacement of the diaphragm to said electrical signal.

16. (Currently Amended) A disposable extracorporeal blood circuit for processing blood from a mammal and attachable to a blood treatment device having a blood pump and a filtrate pump, said blood circuit comprising:

a blood passage having a blood withdrawal port connectable to a ~~withdrawal peripheral blood vessel~~ vascular system of the mammal, a blood return port connectable to ~~a return peripheral blood vessel of the patient~~ the vascular system, and a blood passage between the withdrawal port and the return port through which blood flows wherein the blood passage has a smooth and continuous wall throughout the passage;

~~a pressure sensor having a fluid passage having a uniform internal diameter substantially the same as an internal diameter of the blood passage, and said fluid passage having a fluid inlet or and outlet coupled to said blood passage, and a fluid pressure responsive element flush with a wall of the fluid passage,~~

a blood filter having a blood inlet and a blood outlet ~~both~~ coupled to said blood passage such that the blood flows through said filter, and said filter further comprising a filtrate output coupled to a filtrate line,

a first cartridge housing to which is attached a blood loop of the blood passage and the pressure sensor, wherein the blood passage is mounted to an inside surface of the first cartridge housing such that the blood loop extends outwardly of the cartridge housing, and said first cartridge housing is detachably mountable to a the blood treatment device to engage the blood loop to ~~a~~ the blood pump when the first cartridge housing is mounted on the device~~, and wherein said cartridge includes an electrical connection for electrically coupling the pressure sensor to the blood pump~~, and

a second cartridge housing to which is attached a filtrate loop of the filtrate line ~~and the filter~~, wherein the filtrate line is mounted to an inside surface of the second cartridge housing such that said filtrate loop extends outwardly of the second cartridge housing, said second cartridge housing is distinct and separate from the first cartridge housing, and said second cartridge housing is detachably mountable to the device to engage the filtrate loop to a the filtrate pump of the blood treatment device.

17. (Currently Amended) A disposable extracorporeal blood circuit as in claim 16 ~~wherein said blood passage includes a tubular withdrawal line connectable to a first catheter inserted into the first blood vessel and to said pressure sensor, a tubular blood circuit line connecting the pressure sensor and the blood inlet of the filter, and a tubular return line connected to the blood outlet of the filter and connectable to a catheter inserted in said second blood vessel~~ further comprising a pressure sensor fixed to the inside surface of the first cartridge housing and connected to the blood passage, wherein said pressure sensor outputs a signal indicative of a blood pressure in the blood passage.

18. (Currently Amended) A disposable extracorporeal blood circuit as in claim ~~17~~ 16 wherein the tubular blood circuit line is connectable to a roller blood pump of the blood pump.

19. (Original) A disposable extracorporeal blood circuit as in claim 16 wherein the withdrawal and return blood vessels are the same blood vessel.

20. (Currently Amended) A cartridge as in claim [[4]] 6 further comprising a third pressure sensor arranged to sense a blood pressure in return blood passage included with the disposable cartridge.

21. (Currently Amended) A cartridge as in claim ~~14~~ 3 further comprising electrical signal connectors extending from the pressure sensor on the cartridge to a detachable electrical coupling on the blood pump device.

22. (New) A cartridge as in claim 30 wherein the blood filter in the second cartridge housing is substantially vertical when said second cartridge housing is mounted in the device, and wherein said filter has a bottom filtered blood outlet to the blood passage.

23. (New) A disposable extracorporeal blood circuit as in claim 16 wherein the blood filter in the second cartridge housing is substantially vertical when said second cartridge housing is mounted in the device, and wherein said filter has a bottom filtered blood outlet to the blood passage.

24. (New) A cartridge as in claim 1 wherein blood pump coupling loop of said first cartridge housing extends substantially vertical when attached to the pump device and the filtrate pump coupling loop of the second cartridge housing extends substantially vertical when attached to the filtrate pump.

25. (New) A disposable extracorporeal blood circuit as in claim 16 wherein blood pump coupling loop of said first cartridge housing extends substantially vertical when attached to the pump device and the filtrate pump coupling loop of the second cartridge housing extends substantially vertical when attached to the filtrate pump.

26. (New) A cartridge as in claim 1 wherein said first cartridge housing has an inside side surface facing the device when the first cartridge housing is seated on the

device, and wherein said blood passage is attached to the inside surface of the first cartridge housing.

27. (New) A cartridge as in claim 1 wherein said second cartridge housing has an inside side surface facing the device when the second cartridge housing is seated on the device, and wherein said filtrate passage and a filter are attached to the inside surface of the second cartridge housing.

28. (New) A blood circuit as in claim 1 wherein said first cartridge housing is seated on a front of the device and the second cartridge housing is seated on a side of the device.

29. (New) A blood circuit as in claim 16 wherein said first cartridge housing is seated on a front of the device and the second cartridge housing is seated on a side of the device.

30. (New) A blood circuit as in claim 1 further comprising a blood filter having an input and a blood output coupled to the blood passage and a filtrate outlet coupled to the filtrate line, wherein said filter is fixed to the second cartridge housing.

31. (New) A blood circuit as in claim 30 wherein said filter is oriented vertically on the second cartridge housing when said housing is mounted on the device, and said filter inlet is at a top of the filter.

32. (New) A filter for a blood circuit comprising:

a housing having a blood inlet and a blood outlet, and a filtrate outlet;

a filter medium in the housing and arranged between the blood inlet and blood outlet, and

a pressure sensor attached to the housing and for monitoring a pressure of blood in the housing.

33. (New) A filter as in claim 32 wherein said filter is fixed to a cartridge housing of a blood circuit.

34. (New) A filter as in claim 32 wherein said housing further comprises a cylinder arranged vertically when filtering blood, and blood inlet is at a top end of said cylinder, said blood outlet is at a bottom end of said cylinder and said filtrate output is at a side of the cylinder.